Involvement of Parkinson's disease 7 in inflammatory bowel diseases: relation to interleukin-17 and tumor necrosis factor-alpha

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Introduction: The therapy of inflammatory bowel diseases (IBD) is still unresolved, however, recent studies suggested the importance of interleukin (IL)-17. Parkinson's disease 7 (PARK7) is an antioxidant, immunoregulatory molecule, but its relation to IL-17 and the core TNF-α related pathway of IBD is completely unknown. Thus we aimed to investigate its involvement in the pathogenesis of IBD.

Materials and methods: The mRNA expression, protein level and localization of PARK7 were determined in colon biopsies of children with IBD, in colon of wild type and *Il17* KO mice with dextran sodium sulphate (DSS)-induced colitis and in IL-17-treated HT-29 colonic epithelial cells by real-time PCR, western blot, flow cytometry, and immunofluorescence staining, respectively. The effect of PARK7 on TNF-α was measured in PARK7 specific silencing RNA treated HT-29 cells.

Results: Expression of PARK7 and IL-17 was elevated in the colonic mucosa of children with IBD and also in the colon of wild type mice with DSS-induced colitis compared to controls. Lack of IL-17 in *Il17* KO mice prevented the DSS-induced elevation of colonic PARK7 level *in vivo*. Similarly, IL-17 treatment induced the production of PARK7 and TNF-α of HT-29 colon epithelial cells *in vitro*. TNF-α production were even more pronounced in the PARK7 siRNA treated HT-29 cells.

Conclusion: Increased expression of PARK7 in IBD suggest its involvement in the disease pathogenesis. Moreover, we demonstrated that PARK-7 is an endogenous regulator of the IL-17 induced production of TNF-α. Taken together our data suggest that PARK7 may be a therapeutic target in the future.

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